



Solutions for Demanding Applications

VarTech Systems Inc.

Industrial CRT and Flat Panel Displays



VT150 ColorVue Series
15.0" Flat Panels
VT150CC · VT150PC
VT150RC · VT150WC · VT150MC

User's Guide

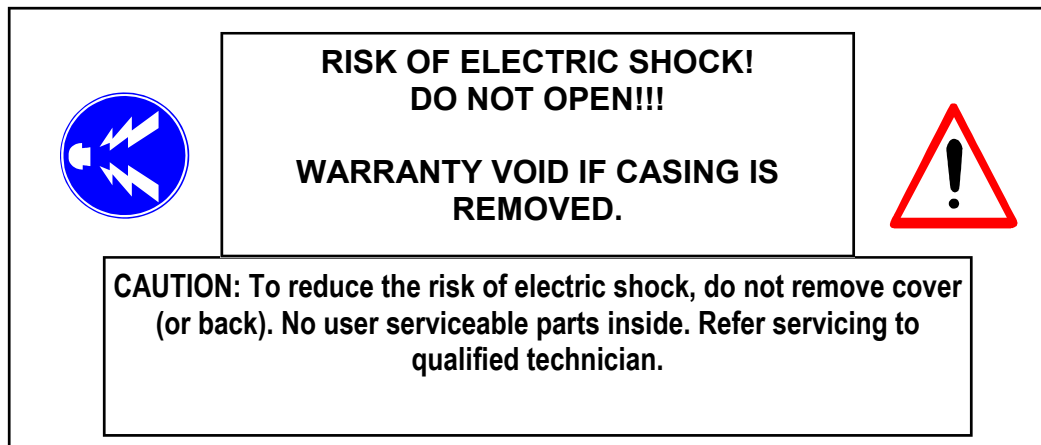
Read these instructions completely before attempting to operate your new Color Display.

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WARNING AND CAUTIONS



WARNING

TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS MONITOR TO RAIN OR MOISTURE.

"HIGH VOLTAGE EXISTS ON THE BACKLIGHT POWER LEAD OF THIS MONITOR. BEFORE SERVICING, DETERMINE THE PRESENCE OF HIGH VOLTAGE BY CONNECTING THE H.V. METER BETWEEN THE BACKLIGHT POWER LEAD AND CHASSIS ONLY."

CAUTION

1. Keep monitor away from excessive dust, high temperature, moisture or direct sunlight.
2. Use in well ventilated area and do not cover ventilation openings.
3. Unauthorized modifications of this equipment or substitution or attachment of not shielded connecting cable may cause excessive interference.
4. When the monitor is not in use for a long time, turn off power switch.

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FCC STATEMENT

Federal Communications Commission (F.C.C.) Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a industrial installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient/Relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or TV technician for help.

CAUTION: Changes or modifications not expressly approved by the manufacturer responsible for compliance could void the user's authority to operate the equipment.

DOC Compliance Notice

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

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SAFETY PRECAUTIONS

Product Safety Precautions

- ⇒ Ensure that sufficient space is available around the display to provide the circulation necessary for cooling.
- ⇒ Ensure that the ambient air temperature will not exceed the specified maximum temperature.
- ⇒ Do not attempt to service this display yourself. The rear chassis has a seal so that non qualified personal will not expose themselves to dangerous voltages or other risks.
- ⇒ To protect from electrical shock, unplug the display power supply from the wall before moving.
- ⇒ Do not expose the display to direct sunlight or heat.
- ⇒ Do not use this display near water
- ⇒ Do not place any heavy objects on the power cords. Damage may cause electrical shock.
- ⇒ Unplug the power supply from the wall or unit if one of the following conditions exists.
 - ⇒ Power cord or plug is damaged or frayed
 - ⇒ Liquid is spilled into the display or the display is exposed to rain or water.
 - ⇒ The display does not operate normally when the operating instructions are followed.
 - ⇒ The display has been dropped or the enclosure has been damaged.
 - ⇒ The display exhibits a distinct change in performance, indicating a need for service.

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4.1 Unpacking and setting up your display

Your LCD monitor package will consist of the components listed below. Open shipping container and lay all components on a flat clean surface.

- ⇒ VT150CC, VT150RC, VT150PC, VT150MC or VT150WC LCD Monitor
- ⇒ 15-PIN D-sub Video cable
- ⇒ AC power cord
- ⇒ User Manual or CD ROM

4.2 Installation

This analog LCD display DOES NOT require any special drivers. Necessary drivers are supplied by the video card manufacturer and may be found on the diskettes supplied with the video card that came with your computer. Windows 95/98 drivers for both the display and the video card are supplied on the Windows 95/98 CD or diskettes. Unfortunately, Microsoft did not provide a complete listing of the displays on the initial retail release. You may use the standard XGA (1024 x 768 @ 60) as the display type. The video card must also be set up correctly in Windows 95/98 and make sure the video output of the VGA card is on list in Section 5.1 or check your Video Card manual or Windows 95/98 Read me file for further information on Video Card. After the question listed above is solved, we continue the setup procedure as below.

1. Turn power off both Computer and Display before making any connection.
2. Install Display on the solid horizontal surface such as a table or desk.
3. Connect the power cable to the back of the LCD monitor.
4. Connect the signal cable on the rear of the monitor to the 15-pin connector on the rear of the computer and tighten the screws.

IBM PC's & Compatibles

Connect one end of the signal cable to the 15-pin connector on the rear of the computer.

Apple/Macintosh

Connect a MAC adapter to the video connector on the rear of the Apple/Macintosh computer. Then plug the other end of the signal cable into the MAC adapter. (Contact your local Apple dealer for information on purchasing the correct conversion connector.)

5. Tighten the screw of the Display cable until the connectors are fastened securely.
6. Switch on power to the Display, then to the monitor.

4.3 Video Input Pin Assignment

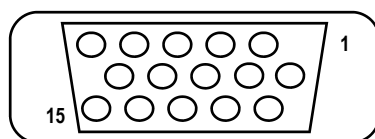
This section describes the pin assignment of the LCD's video connector.

HD15 Video Connector

The following table provides the pin numbers and corresponding pin assignments for the HD-15 video connector.

Note:

The following figure is the view looking into the solder terminal end of the female connector.



Pin assignments for the HD15 video connector	
Pin	Connection
1	Red Video
2	Green Video
3	Blue Video
4	No Connection
5	Ground
6	Red Video Ground
7	Green Video Ground
8	Blue Video Ground
9	No Connection
10	Ground
11	No Connection
12	DDC data
13	Horizontal Sync
14	Vertical Sync
15	DDC Clock

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5.1 Introduction

Touch screens are a common means to interface operator inputs to a system. The universal standard of Windows GUI (Graphical User Interface) has significantly increased the use of touch screens.

There are four main touch technologies. The technologies are resistive, surface acoustic wave (SAW), capacitive, and infrared (IR). Each touch technology has advantages and disadvantages based on different user applications.

5.2 Installation

All Vartech Systems displays configured with a touch screen are supplied with a CDROM which includes user manuals, application software, and drivers for various operating systems. Insert the supplied CDROM into a CDROM drive and follow the installation instructions that will appear on the screen.

Limited technical support is available by contacting Vartech Systems customer support at 800-223-8050.

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DISPLAY TIMING

The following table lists the better display quality modes that the LCD monitor provides. If the other video modes are input, the monitor will stop working or display unsatisfactory picture quality.

VESA MODES					
Mode	Resolution	Total	Horizontal Nominal Frequency ±0.5KHz	Vertical Nominal Frequency ±1Hz	Nominal Pixel Clock (MHz)
DOS	720 x 400@70Hz	900 x 449	31.469	70.087	28.322
VGA	640 x 480@60Hz	800 x 525	31.469	59.940	25.175
	640 x 480@72Hz	832 x 520	37.861	72.809	31.500
	640 x 480@75Hz	840 x 500	37.500	75.000	31.500
SVGA	800 x 600@56Hz	1024 x 625	35.156	56.250	36.000
	800 x 600@60Hz	1056 x 628	37.879	60.017	40.000
	800 x 600@72Hz	1040 x 666	48.077	72.188	50.000
	800 x 600@75Hz	1056 x 625	46.875	75.000	49.500
XGA	1024 x 768@60Hz	1344 x 804	48.363	60.004	65.000
	1024 x 768@70Hz	1328 x 806	56.476	70.069	75.000
	1024 x 768@75Hz	1312 x 800	60.023	75.029	78.750

Table 6.1 Applicable video timing - VESA Modes

Display Timing Cont.

IBM MODES					
Mode	Resolution	Total	Horizontal Nominal Frequency ±0.5KHz	Vertical Nominal Frequency ±1Hz	Nominal Pixel Clock (MHz)
EGA	640 x 350@70Hz	800 x 449	31.469	70.086	25.175
CGA	640 x 480@60Hz	800 x 449	31.469	70.086	25.175
DOS	800 x 600@56Hz	900 x 449	31.469	70.087	28.322
VGA	800 x 600@60Hz	800 x 525	31.469	59.940	25.275
XGA	800 x 600@72Hz	1304 x 798	57.515	72.100	75.000

Table 6.2 Applicable video timing - IBM Modes

MAC MODES					
Mode	Resolution	Total	Horizontal Nominal Frequency ±0.5KHz	Vertical Nominal Frequency ±1Hz	Nominal Pixel Clock (MHz)
VGA	640 x 480@60Hz	800 x 525	31.469	59.940	25.175
	640 x 480@67Hz	864 x 525	35.000	66.667	30.240
SVGA	832 x 624@75Hz	1152 x 667	49.725	74.551	57.283
XGA	1024 x 768@60Hz	1312 x 813	48.780	60.001	64.000
	1024 x 768@75Hz	1328 x 804	60.241	74.927	80.000





Table 6.3 Applicable video timing - MAC Modes

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DISPLAY CONTROLS

7.1 Display Controls



Button	Description	Function
	Power (Located on the rear of the monitor)	Press the power key to turn the monitor on. Press it again to turn the monitor off
	MENU	Enter or exit the OSD adjustment menu. Exit from the submenu back to the previous menu.
	SELECT	To confirm the current selection.
	ADJUST UP	To scroll up in menu or to increase value of selected item.
	ADJUST DOWN	To scroll down in menu or to decrease value of selected item.

7.2 Screen Adjustment Operation Procedure

1. Entering the screen adjustment

The setting switches are normally at stand-by. Push the MENU button once to display the main menu of the screen adjustment. The adjustable items will be displayed in the main menu.

2. Entering the settings

Use the Adjust ▲ and Adjust ▼ buttons to select the desired setting icon and push the SELECT button to enter sub-menu.

3. Change the settings

After the sub-menu appears, use the Adjust ▲ and Adjust ▼ buttons to change the setting values.

4. Save

After finishing the adjustment, push the SELECT button to memorize the setting.

5. Return & Exit the main menu

Exit the screen adjustment, push the 'SELECT' button at the 'EXIT' of "MISC MENU". When no operation is done around 60 sec (default OSD timeout), it goes back to the stand-by mode and no more switching is accepted except MENU to restart the setting.

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SCREEN ADJUSTMENT

8.1 Main Menu





The OSD main menu (Figure 8-1) is displayed on screen when the MENU key is pressed. The OSD menu is a combination of graphic and text display. The column inside the OSD menu will show information of input image. Second column beneath OSD menu shows the item selected.




The UP and DOWN keys are used to scroll through items within the menu. The selected item is highlighted as the scrolling moves along. The SELECT key is used to activate the highlighted item during this state.



Figure 8.1 - OSD Main Menu

8.2 OSD Adjusting and Controls

OSD Functions		
Symbol	description	Function
	AUTO CONFIG	Auto Config is used to adjust the configuration of the phase · clock · vertical and horizontal position automatically. A confirmation box is displayed to confirm the user selection. The default selection in the box is “NO” and is highlighted by a red bar. If the SELECT key is pressed, the main menu is re-displayed and nothing is changed. When “YES” is selected, automatic configuration is started. After the process is completed successfully, a confirmation box, “Does this image look correct”, is displayed. If image is correct, select “YES” to exit confirmation box. If image isn’t correct, select “NO” to PHASE item adjustment, and adjust the phase manually to the best image quality.
	BRIGHTNESS	Brightness is used to setup the brightness of the panel.
	CONTRAST	Contrast is used to adjust image contrast.
	COLOR	<p>The main menu item “COLOR” is a sub-menu which contains items to adjust the PC graphic imaging.</p> <p>RED Red is used to adjust the gain of the red channel in ADC.</p> <p>GREEN Green is used to adjust the gain of the green channel in ADC.</p> <p>BLUE Blue is used to adjust the gain of the blue channel in ADC.</p> <p>BLACK LEVEL ADJUST Black level adjust is used to adjust the black-level (zero level offset) of the AD converters.</p>

OSD Functions		
Symbol	description	Function
	POSITION	<p>Setup the image position within the panel. There are two items: H-POSITION · V-POSITION.</p> <p>H-POSITION H-Position is used to adjust the horizontal image position manually. A slider with current value is displayed.</p> <p>V-POSITION V-Position is used to adjust the vertical image position manually. A slider with current value is displayed.</p>
	IMAGE	<p>Configure the image frequency.</p> <p>PHASE Phase is used to adjust the ADC sample pixel clock. A slider with the current value is displayed. The range of phase adjustment value is 0 to 100 for 0 to 360 degrees.</p> <p>CLOCK Clock is used to adjust the number of clocks (pixels) per line (sample per line). A slider with current value is displayed.</p>
	MISC MENU	<p>Miscellaneous setting. There are three items: RESET · OSD POSITION · SYSTEM INFO.</p> <p>RESET Reset is used to reload all factory default parameters.</p> <p>OSD POSITION OSD Position is used to setup the OSD menu position. The OSD menu horizontal and vertical position is adjusted separately. Each position adjustment item will bring up the slider window. The maximum value of the sliders are based on the size of the OSD menu.</p> <p>SYSTEM INFO The system info menu provides the user with detailed information regarding the current input format and version. (VERSION · V-FREQ · H-FREQ · RESOL).</p>

Note:

If you don't press any key for 45 seconds, the OSD will disappear by itself and the parameters will not be saved.

8.3 How to use AUTO CONFIG Adjustment

This function can tune the parameters of PHASE · CLOCK · H-POSITION and V-POSITION.

Suggesting Adjustment Steps:

Step 1:

Enter the Windows 95/98 Shut-down frame. (Note the Wallpaper color CAN NOT be black.)

Step 2:

Enter OSD Main Menu and choose “AUTO CONFIG”, then press SELECT key. The picture will auto-adjust by itself.

After 4 seconds, you can exit OSD and Shut-down frame.

Step3:

If you are still not satisfied with the picture quality, you can choose CONTRAST item in OSD Main Menu and adjust it.

NOTE:

1. If you don't like the effect of AUTO CONFIG adjustment, you can adjust PHASE, CLOCK, H-POSITION and V-POSITION in OSD.
2. AUTO CONFIG adjustment can be used in Windows 95/98 except black background frame, but the best effect is in the SHUT DOWN frame.
3. It is recommended to run “EDIT” program first, then do AUTO CONFIG adjustment in DOS mode.

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TROUBLESHOOTING

Troubleshooting Tips	
Problem	Troubleshooting Tip
No image on display screen	<ol style="list-style-type: none"> 1. Check that power cord of the computer has been connected securely into wall outlet or grounded extension cable or strip. 2. Check that power switch of the Display has been pressed. 3. Check that Video (Signal) Cable from the Display has been securely and correctly connected. 4. Check that Video Card is firmly seated in card slot of Computer motherboard. 5. Check that the video input from the Video Card falls within the timing range (listed in the table of section 6) of the Display.
Abnormal image	<ol style="list-style-type: none"> 1. Check that the video input from the Video Card falls within the timing range (listed in the table of section 6) of the Display. 2. Check that Video (Signal) Cable from the Display has been securely and correctly connected to the Video Connector at the rear side of the Computer.
Colors of image on screen are abnormal	<ol style="list-style-type: none"> 1. Check that Video (Signal) Cable from the displays has been securely and correctly connected to the 15-pin Video Connector at the rear side of the computer.
Disturbances on Screen	<ol style="list-style-type: none"> 1. OSD adjustment is incorrect. Please consult section 8 for OSD screen adjustment procedures.

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CLEANING AND MAINTENANCE

Cleaning

Occasionally clean the display panel and cabinet with a soft cloth dampened (not soaked) with a mild (non-abrasive) glass cleaner. Keep turning a fresh side of the cloth toward the screen surface to avoid scratching it with accumulated grit.

Note:

The solvent should be applied only to the cloth, and not directly on the monitor screen. Do not use paper products as they may scratch the surface. To minimize the risk of abrasion, allow the screen to stand dry.

Special care should be taken when cleaning a touch screen or polycarbonate shield that is installed over the screen. Abrasive and certain chemical cleaners can easily damage the surface.

Never use alcoholic or ammoniac cleaners to clean the polycarbonate shield or a touch screen.

Replacing a Line Cord

To avoid shock and fire hazards, the monitor's power cord should be replaced if the insulation becomes broken or if it develops a loose internal connection.

Other Maintenance

Qualified service personnel should perform all maintenance, except for the power cord replacement described above.

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MECHANICAL DRAWINGS

Mechanical Drawings

Model	Description	Page(s)
VT150PC	15.0" ColorVue Panel Mount Mechanical Drawing	17
VT150RC	15.0" ColorVue Rack Mount Mechanical Drawing	18
VT150WC	15.0" ColorVue Wall Mount Mechanical Drawing	19
VT150CC	15.0" ColorVue Chassis Mount Mechanical Drawing	20

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SPECIFICATIONS

VT150 ColorVue Specifications	
LCD panel type	15.0" TFT
Resolution	XGA 1024 x 768 Max.
Pixel dimension	0.297mm
LCD display color	16.7M Colors max.
OSD control	H/V Position, Clock, Phase, Auto Config, Expand, Information, Recall, Edge Filter, Color, OSD Adjust, Contrast, Brightness, Exit
Manual Control	Menu, Select, Adjust (▲ ▼) Power
Viewing angle	Left / Right: 60/60° max. Up / Down: 40/60° max.
Contrast ratio	300:1 typ.
Brightness	250cd/m ² Typ.
Response time	T _R : 10ms typ. T _F : 10ms typ.
Active display area: VT150WC / T150MC VT150PC / VT150RC / VT150CC	12.11" x 9.12" / 304.1mm x 228.1mm 12.03" x 9.09" / 305.5mm x 230.8mm
AC Input	AC 100/240V, 50/60Hz
Input connector	HD15
Input signal	Video: Analog 0.7V p-p 75Ω Sync; TTL Level, Positive/Negative, Separate Sync
Scan Frequency	Horizontal: 31 to 60kHz Vertical: 56 to 75Hz
Power Consumption	30 Watts Maximum
Power management	VESA DPMS Compatible
Regulation	Safety: DHHS, FCC A
Temperature	Operation: 0 to 50°C Storage: -20 to 60°C
Plug & Play	DDC 2B

VARTECH SYSTEMS INC.

HEADQUARTERS

11529 Sun Belt Ct.

Baton Rouge, Louisiana 70809

Toll-Free: 800.223.8050

International Phone: 001.225.298.0300

Fax: 225.297.2440

E-mail: sales@vartechsystems.com

www.vartechsystems.com

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